Planning Subsystem Overview

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Subsystem Overview & Status

ECS context

Design Drivers

HW and SW Architecture

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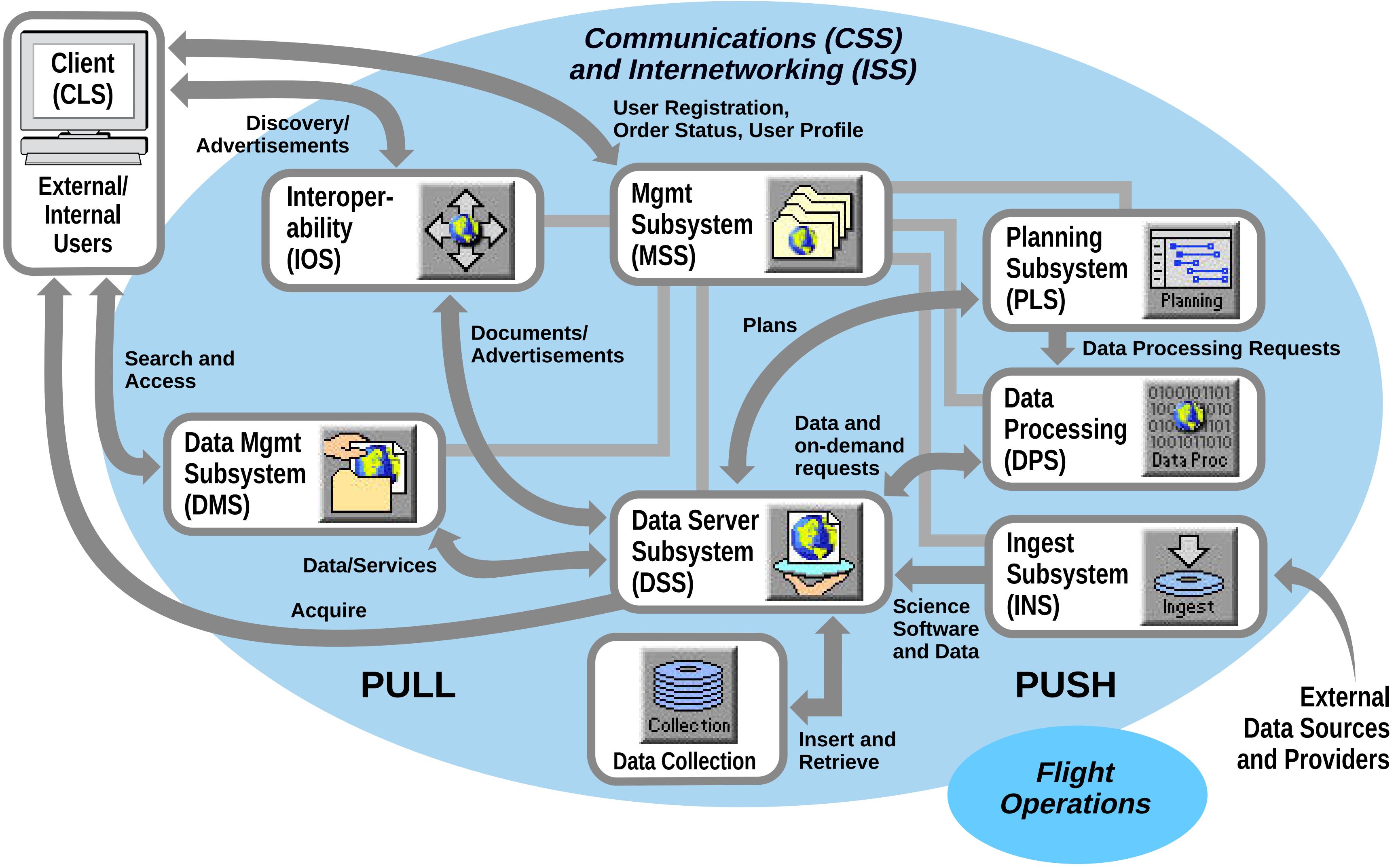
IDR & Workshop Issues Workoff

Prototypes and Trades

Design Changes from IDR

305 Errata

ECS Context


Client
(CLS)
External/
Internal
Users
Communications (CSS)
and Internetworking (ISS)
Discovery/
Advertisements
User Registration,
Order Status, User Profile
Interoper-
ability
(IOS)
Mgmt
Subsystem
(MSS)
Planning
Subsystem
(PLS)
Planning
Search and
Access
Documents/
Advertisements
Plans
Data Processing Requests
Data
Processing
(DPS)
Data Proc
Data Mgmt
Subsystem
(DMS)
Data and
on-demand
requests
Data Server
Subsystem
(DSS)
Data/Services
Ingest
Subsystem
(INS)
Ingest
Acquire
Science
Software
and Data
PULL
Collection
Data Collection
Insert and
Retrieve
PUSH
External
Data Sources
and Providers
Flight
Operations

Design Drivers

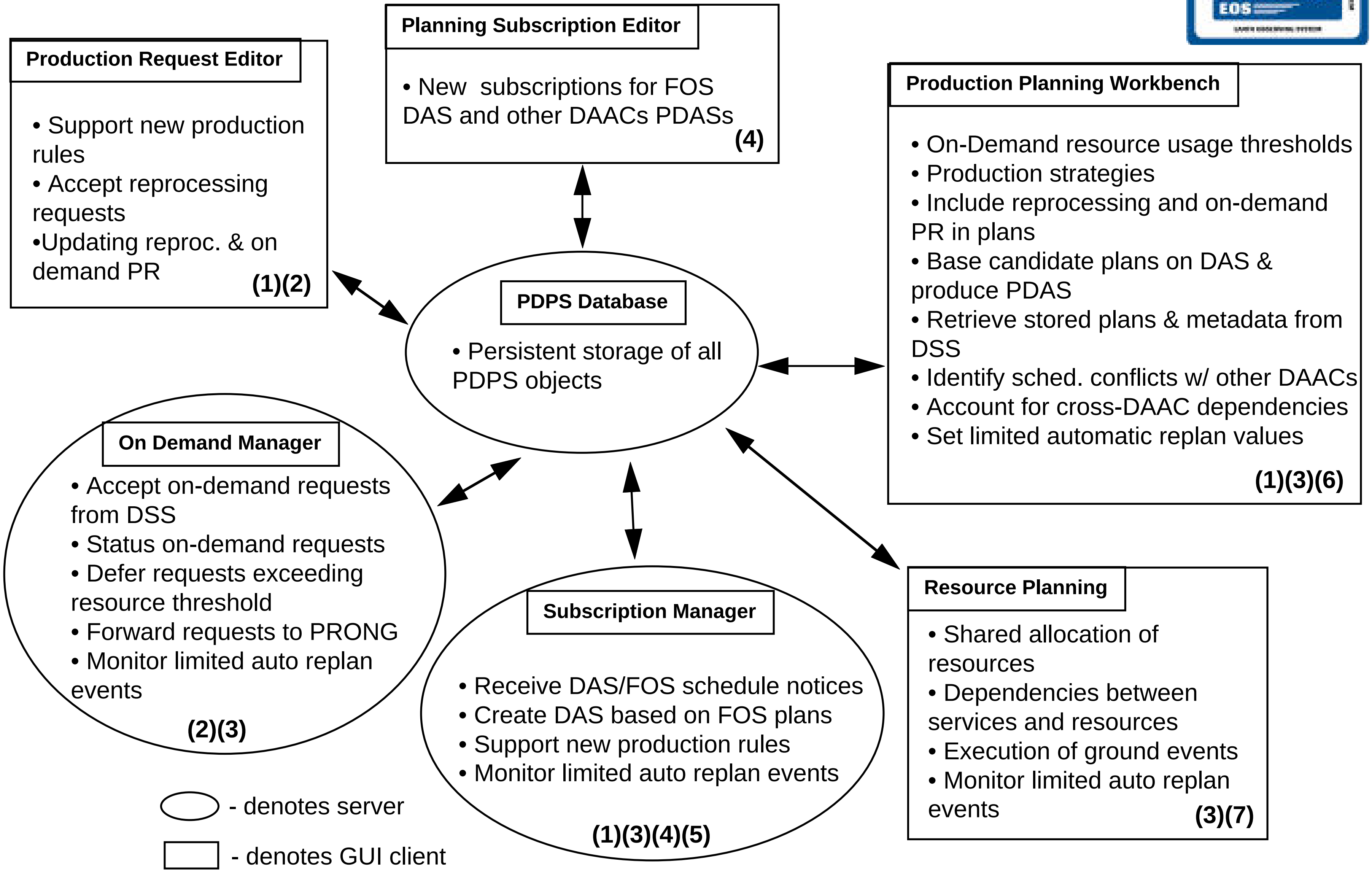
General Functional Description

- Production Plan creation, activation, and modification
- Basic resource planning
- Support TRMM instruments

New Release B Features

- Support AM-1 instruments
  - New production rules (1)
  - Large-scale reprocessing; On-Demand requests (2)
- Limited Automatic Replan
  - Helps to automate large number of jobs (3)
- Use of FOS Detailed Activity Schedule
  - Allows for better estimate of data arrival from EDOS (4)
  - Provides needed information on instrument modes (5)
- Inter-DAAC dependencies
  - Provide tools to monitor this complexity (6)
- Enhanced Resource Planning (7)

Release B Requirements by CSC



Production Request Editor

- Support new production rules
- Accept reprocessing requests
- Updating reproc. & on demand PR

(1)(2)

Planning Subscription Editor

- New subscriptions for FOS DAS and other DAACs PDASs

(4)

Production Planning Workbench

- On-Demand resource usage thresholds
- Production strategies
- Include reprocessing and on-demand PR in plans
- Base candidate plans on DAS & produce PDAS
- Retrieve stored plans & metadata from DSS
- Identify sched. conflicts w/ other DAACs
- Account for cross-DAAC dependencies
- Set limited automatic replan values

(1)(3)(6)

PDPS Database

- Persistent storage of all PDPS objects

On Demand Manager

- Accept on-demand requests from DSS
- Status on-demand requests
- Defer requests exceeding resource threshold
- Forward requests to PRONG
- Monitor limited auto replan events

(2)(3)

Subscription Manager

- Receive DAS/FOS schedule notices
- Create DAS based on FOS plans
- Support new production rules
- Monitor limited auto replan events

(1)(3)(4)(5)

Resource Planning

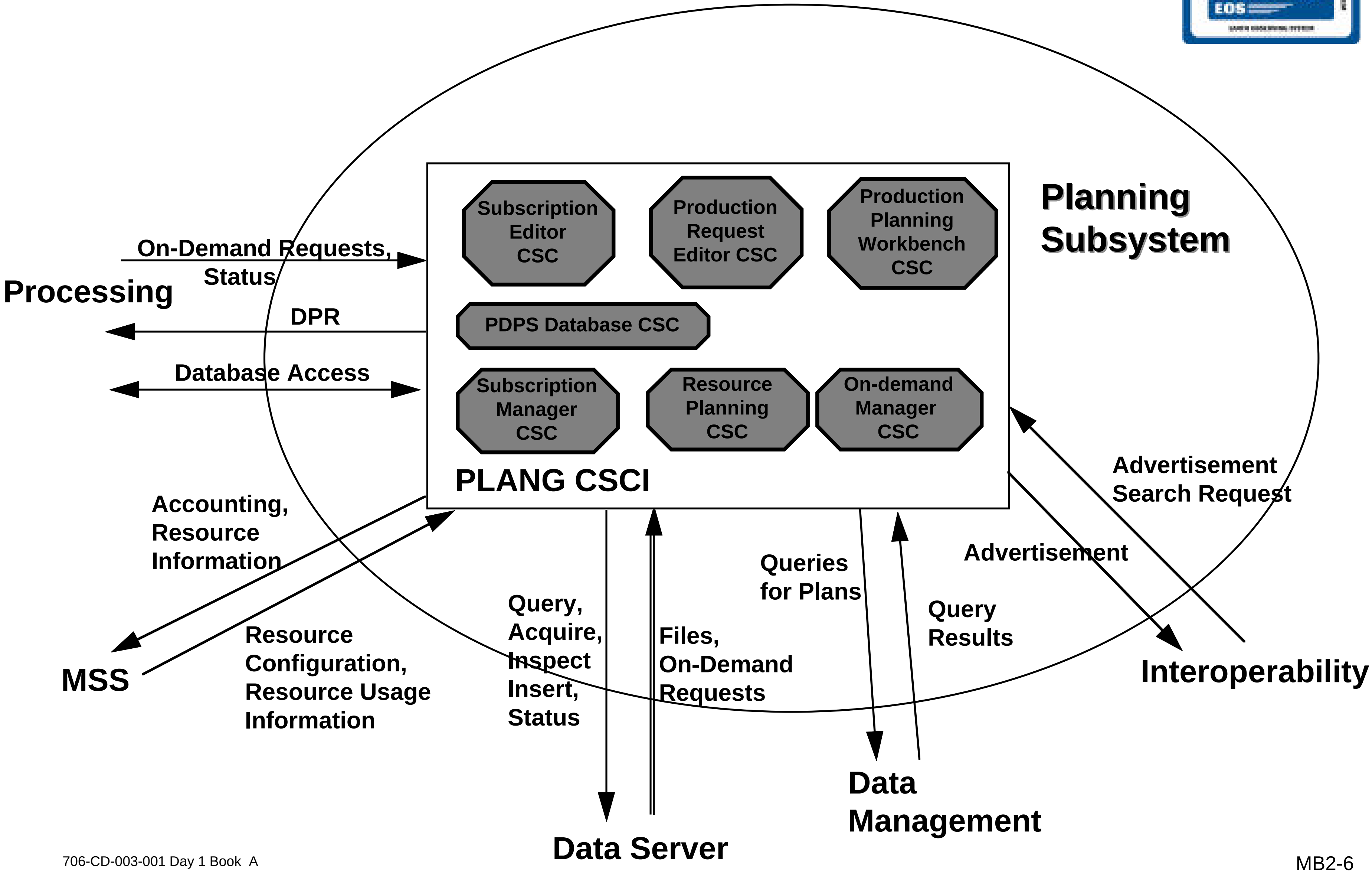
- Shared allocation of resources
- Dependencies between services and resources
- Execution of ground events
- Monitor limited auto replan events

(3)(7)

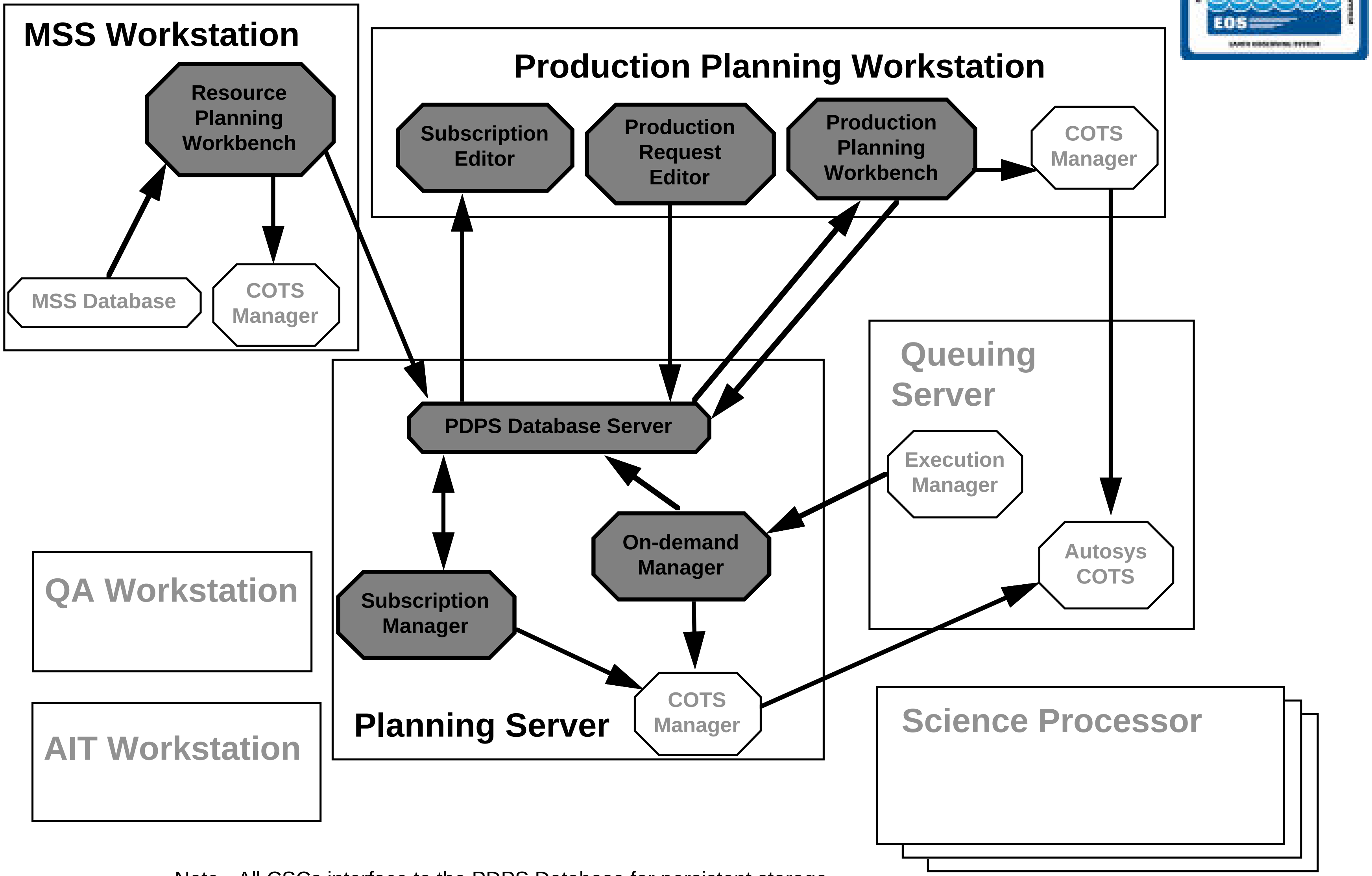
○ - denotes server

▭ - denotes GUI client

Software Architecture Overview


Planning Subsystem
Subscription Editor CSC
Production Request Editor CSC
Production Planning Workbench CSC
PDPS Database CSC
Subscription Manager CSC
Resource Planning CSC
On-demand Manager CSC
PLANG CSCI
Processing
On-Demand Requests, Status
DPR
Database Access
MSS
Accounting, Resource Information
Resource Configuration, Resource Usage Information
Data Server
Query, Acquire, Inspect Insert, Status
Files, On-Demand Requests
Data Management
Queries for Plans
Query Results
Interoperability
Advertisement
Advertisement Search Request

Hardware Architecture Overview



Note - All CSCs interface to the PDPS Database for persistent storage,
but those interfaces aren't shown for simplicity

COTS Selections

COTS Inherited from Release A

- Delphi Class Libraries
- Sybase
- COTS Hardware - DAAC-specific SMP Servers and Workstations

New COTS in Release B

- No new COTS that affects design

IDR and Workshop Issues Summary

Status

- **IDR**
  - **3 RIDs 3 closed**

- **Ops Workshop**
  - **7 issues 7 accepted**

- **Production Rules Telecon**
  - **no formal issues, but many items accepted and closed**

IDR and Workshop Issues

ISSUE	ORIGIN	STATUS	RESOLUTION
Support for Planning Reprocessing Efforts	RID - 20	Closed	Added Production Request costing to design
L4 Requirements to Design Trace Deficiencies	RID - 41	Closed	The CDR-B documentation reflects the correct mapping (305-CD-026-002)
Planning and Scheduling manual QA activities	RID - 44	Closed	Planning system provides production rules to handle this
End-to-end cross DAAC planning is weak - concerned that it is not well integrated	IDR - C1	Accepted	Presented inter-DAAC planning scenarios at Ops. Workshop; enhanced display tools
Investigate methods for notification of production delays.	OWS - 25	Accepted	Added capability to monitor production against operator-specified tolerances in Data Processing
Determine if there is a requirement for an automated analysis tool.	OWS - 33	Accepted	Reporting against target dates and the baseline plan in addition to graphical displays handles this
Use of HTML for resource requests	OWS - 34	Accepted	Use of secure X11 protocol will handle this need
Resource reservation information should contain configuration	OWS - 35	Accepted	This data can be entered in the comment section of the resource reservation
Multiple "late data notification" switches	OWS - 89	Accepted	Added a switch per DataType to design
On what are you basing your product dependencies?	OWS - 90	Accepted	Product dependencies are based on predictions of future data availability
The Resource Utilization Plan should include the cost/impact of obtaining data (both inter-site and local).	OWS - 91	Accepted	Added this to the cost section of the Resource Utilization report

Prototypes & Trades

Planning Algorithm Prototype (Release A)

- Completed by Release A
- Algorithm needed minimal adjustment for Release B

Planning Rules Study

- Held Production Rules telecon on 5 Feb 96
- Feedback is incorporated in Production Rules White Paper (445-WP-001-001)

Inter-DAAC Planning Prototype

- Goal was to determine maximum use of Delphi for displaying inter-DAAC dependencies
- Result was that the Delphi timeline has support for the following:
  - ability to display any number of resources
  - filtering of tasks displayed
  - user-defined color by task or task-type
- These features can be used to display multiple DAACs, filter for only inter-DAAC jobs, and to use color to show the dependencies involved
- Combined with the existing display features, this will provide a complete solution

Design Changes from IDR

- Production Rules - ***Special Topic***
- On-Demand Requests from Data Processing as a part of Exit Handling - ***Special Topic***
- Resource Planning
- Key Mechanisms

Key Mechanisms

Mechanisms through which processes acquire or provide software services:

- **Process Framework (PF)**
  - **Mechanism for incorporating infrastructures required to support distributed computing in the ECS environment**
  - **Provides process initialization and life cycle support**
  - **Sets parameters for naming/directory/security services**
  - **Interfaces to mode management, event logging, synchronous message passing**
  - **Used by all Planning CSCs**
- **Distributed Object Framework (DOF)**
  - **Mechanism for creating remote objects and invoking remote methods**
  - **Provides naming, security, threads, time, and RPC services**
  - **Used by On-Demand Manager**

Key Mechanisms (Cont.)

- Universal Reference (UR)
  - Mechanism for referencing system wide data and service objects
  - Provides externalize and internalize services for objects
  - Used by all Planning CSCs
- Subscription Server (SS)
  - Mechanism for implementing event-action model based on a producer/consumer paradigm
  - Provides subscription and event/action processing services
  - Used by Subscription Manager, Subscription Editor, Production Request Editor, and On-Demand Manager
- Request Tracking
  - Provides near real-time end-to-end status of selected requests (e.g., user orders, ingest, and system backups)
  - Provides access to resource cost information over the life of a request
  - Used by On-Demand Manager

305 Errata

Common Naming Changes 305-CD-027-002 throughout

- All references to GlUR should be EcUrUR
- All references to GlCallback should be DsTClRequest Callback

PGE Profile object model 305-CD-027-002 4.2.1

- Added class PlErrorAction for Exit Handling requests from Data Processing
- Added attributes to PlPGECollection and PlInstrumentModes for Mode-based activation

Production Request object model 305-CD-027-002 4.2.2

- Added classes PlMetaDataChecks and DPRCollection for Mode-based activation
- Added operations PlProductionRequestUI::ModifyMetaDataChecksNB(), ModifyMetaDataChecksNB(), ChangeAltInputOrder(), ChangeAltInputTimer() for mode and metadata-based activation
- Added attribute PlDPRB::myDPRCollection for Exit Handling

Transition to B

Dependencies

- Since PLS & DPS share the PDPS database as a communication mechanism, both will require the same database version of Sybase
- It is likely that PLS & DSS will need the same software version also, since the interfaces for services such as query, inspect, and acquire are changing slightly between Releases A & B. If these remain constant, PLS A could run with DSS B as long as DSS did not make On-Demand Production requests. Likewise, PLS B could run with DSS A as long as PLS did not request any metadata subscriptions.
- The above constraint applies to the MSS and ADSRV processes also.
- PLS and INS should be able to run in any combination since the only interface is through subscriptions.

Data Changes

- Same database comments as noted above
- A script will be run to convert the PDPS database from Rel. A data to Rel. B data format, and vice versa.

Hardware Upgrades

- MRS is considering upgrading the PLS machine in a number of ways. If they include a port to a different platform, then the custom code and COTS will need porting. Likewise, a dedicated PDPS database server may be incorporated in Rel. B, which would require mods in the database code.

COTS Upgrades/Changes

- New version of Sybase mentioned above
- New version of AutoSys will have no, or very minor effects on PLS software